



DIVISION OF
CORPORATION FINANCE

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

August 7, 2012

Via E-mail

Andrew Maslan
Chief Financial Officer
Cytomedix, Inc.
209 Perry Parkway, Suite 7
Gaithersburg, MD 20877

**Re: Cytomedix, Inc.
Form 10-K for the Fiscal Year Ended December 31, 2011
Filed March 29, 2012
Form 10-Q for the Quarterly Period Ended March 31, 2012
Filed May 15, 2012
Form 8-K/A dated February 8, 2012
Filed March 29, 2012
File No. 001-32518**

Dear Mr. Maslan:

We have reviewed your filings and have the following comments. In some of our comments, we may ask you to provide us with information so we may better understand your disclosure.

Please respond to this letter within ten business days by amending your filing, by providing the requested information, or by advising us when you will provide the requested response. If you do not believe our comments apply to your facts and circumstances or do not believe an amendment is appropriate, please tell us why in your response.

After reviewing any amendment to your filing and the information you provide in response to these comments, we may have additional comments.

Form 10-Q for the Quarterly Period Ended March 31, 2012

Condensed Consolidated Financial Statements

Note 3. Business Combinations, page 5

1. Please revise future filings to include the following disclosures for the acquisition of Aldagen, Inc., as required by FASB ASC 805.
 - The primary reasons for the business combination and a description of how the acquirer obtained control of the acquire;

- A qualitative description of the factors that make up the goodwill recognized, such as expected synergies from combining operations of the acquiree and the acquirer, intangible assets that do not qualify for separate recognition, or other factors;
 - The method of determining the fair value of equity instruments issued as consideration, including the replacement warrants;
 - A description of the contingent consideration arrangement and the basis for determining the amount of the payment;
 - Significant assumptions related to the valuation of contingent consideration;
 - An estimate of the range of outcomes for the contingent consideration (undiscounted) or, if a range cannot be estimated, that fact and the reasons why a range cannot be estimated. If the maximum amount of the payment is unlimited, you should disclose that fact.
2. We see that a significant amount of purchase price was allocated to in process research and development (IPR&D). Please tell us how you determined the fair value of the IPR&D. Similar disclosure should also be included within critical accounting policies in future filings. Refer to FASB ASC 730-10-15-4 (f) and 805-20.
3. As a related matter, please expand future filings to include disclosure about the nature of the IPR&D. This disclosure may be included in critical accounting policies within MD&A. The revised disclosure should include the following, to the extent applicable:
- Nature of projects acquired;
 - Summary of values assigned to IPR&D by technology/product;
 - Status of the development of the work at acquisition date and current date;
 - Nature and timing of remaining efforts for completion, including estimated completion date;
 - Value and risks of the purchased R&D;
 - How periods subsequent to the acquisition have been affected by completion of the project and introduction of the technology.
4. Please tell us your accounting treatment for the warrant exercises discussed on page 6.

Item 2. Management's Discussion and Analysis of Financial Condition and Results of Operations

Revenues, page 21

5. We see that you received a \$2.5 million non-refundable fee in February 2012 (in addition to the \$2.0 million fee received in the fourth quarter of 2011) from a top 20 global pharmaceutical partner. Please tell us the amount of revenue recorded from the 2012 and 2011 fees and the basis for the amount recognized and deferred in the first quarter of 2012. Future filings should also include enhanced disclosure about the basis for revenue recorded and deferred from this arrangement during each period presented.

Form 8-K/A dated February 8, 2012 filed on March 29, 2012

Exhibit 99.1 Report of Independent Registered Public Accounting Firm

6. We see from the first paragraph that Ernst & Young audited the period from March 3, 2000 (inception) through December 31, 2011. Please have your auditors revise their report to opine on the inception to date financial statements. In addition, the audit report indicates that the audit was conducted in accordance with “auditing generally accepted in the U.S.” Please have your auditors revise their report to clarify that the audit was conducted in accordance with auditing *standards* generally accepted in the U.S. or the standards of the Public Company Accounting Oversight Board (United States). The city and state of the auditors should also be indicated in their revised report. Please refer to PCAOB Auditing Standard No. 1 and Rule 2-02 of Regulation S-X.

Unaudited Pro Forma Condensed Combined Financial Data

7. Please tell us why you include pro forma adjustments for the unrelated transactions discussed on page 4 that occurred simultaneously with the closing of the acquisition of Aldagen, Inc. It does not appear that the adjustments are “directly attributable” to the business combination under Article 11-02(b)(6) of Regulation S-X.
8. Regarding footnotes (G) and (H), please tell us the nature of the adjustments to gain on debt restructuring and other income (expense) and how you calculated the amount of the adjustment.

We urge all persons who are responsible for the accuracy and adequacy of the disclosure in the filing to be certain that the filing includes the information the Securities Exchange Act of 1934 and all applicable Exchange Act rules require. Since the company and its management are in possession of all facts relating to a company’s disclosure, they are responsible for the accuracy and adequacy of the disclosures they have made.

In responding to our comments, please provide a written statement from the company acknowledging that:

- the company is responsible for the adequacy and accuracy of the disclosure in the filing;
- staff comments or changes to disclosure in response to staff comments do not foreclose the Commission from taking any action with respect to the filing; and
- the company may not assert staff comments as a defense in any proceeding initiated by the Commission or any person under the federal securities laws of the United States.

Andrew Maslan
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You may contact Kristin Lochhead at (202) 551-3664 or me at (202) 551-3676 if you have questions regarding comments on the financial statements and related matters. Please contact Martin James, Senior Assistant Chief Accountant, at (202) 551-3671 with any other questions.

Sincerely,

/s/ Brian Cascio

Brian Cascio
Accounting Branch Chief